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Abstract

TRANSPORT OF IRRADIATED NUCLEAR FUEL ON THE EUROPEAN CONTINENT

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This paper gives an overall description of the present status of irradiated fuel transport in Continental Europe, its administrative, technical and economic aspects and its influence on fuel cycle costs. Transport of irradiated fuel, of processed fissile material and possibly of waste material between different countries on the Continent will become routine within a few years.

Since 1963, MTR fuel elements have been transported routinely from the Continent for processing. Bulk shipments from the first power reactors have not yet begun but it is anticipated that 270 tonnes of irradiated fuel will be unloaded from Continental power reactors before 1968. A major part of this fuel is of sufficiently high value to economically justify its reprocessing and thus increasing fuel shipments are anticipated.

* One of the joint undertakings of the O.E.C.D. European Nuclear Energy Agency.

A brief survey is made of national legislation and transport regulations, as well as procedures necessary for transport approval as laid down in a number of European countries. International regulations, and their underlying safety principles, are mentioned and their importance in achieving uniform application and uniform cask design is discussed.

Casks conforming with the regulations have been manufactured for a number of Continental reactors. Parameters governing cask design arise from regulatory requirements such as fuel temperature limitation during accident conditions which tend to increase overall transport costs. On the other hand, improvements in cask design or in cask utilisation, for example where casks are developed to serve more than one reactor, can achieve a reduction in transport costs. Factors affecting cask payload are described in view of its bearing on transport economy.

Tariffs are indicated for rail and road transport of irradiated fuel. Insurance cover against nuclear damage to third parties is available through insurance pools, and premiums are quoted.

An estimate of overall transport costs together with possible processing tariffs for near-natural uranium indicate that routine shipments to centrally-located processing plants would be reasonable. The influence of transport charges on the total fuel cycle cost is shown.